Oct. 3, 1939. C. I. DUVALL 2,175,111

POWER HACKSAW

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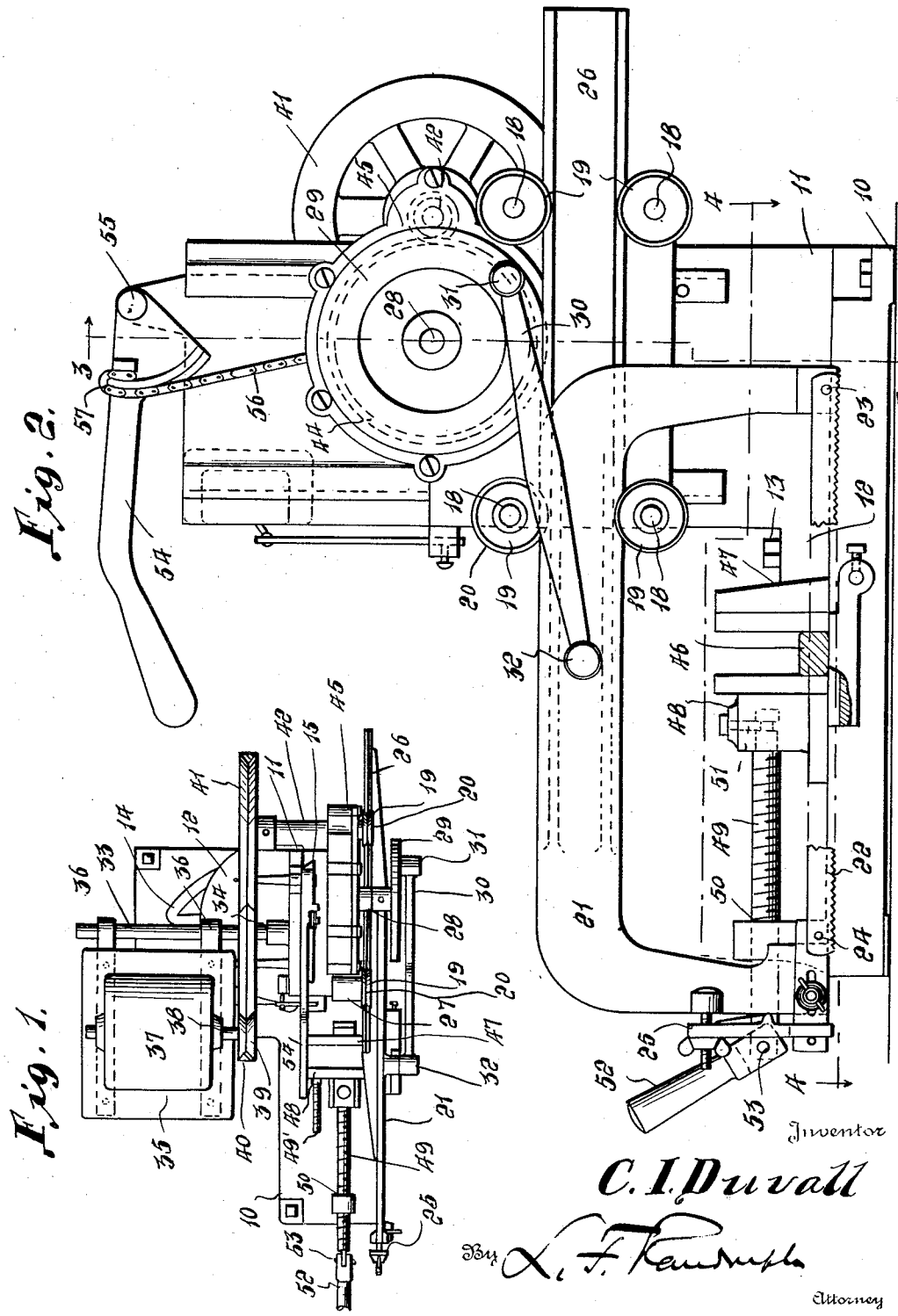


Fig. 2.

Fig. 1.

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Fig. 3.

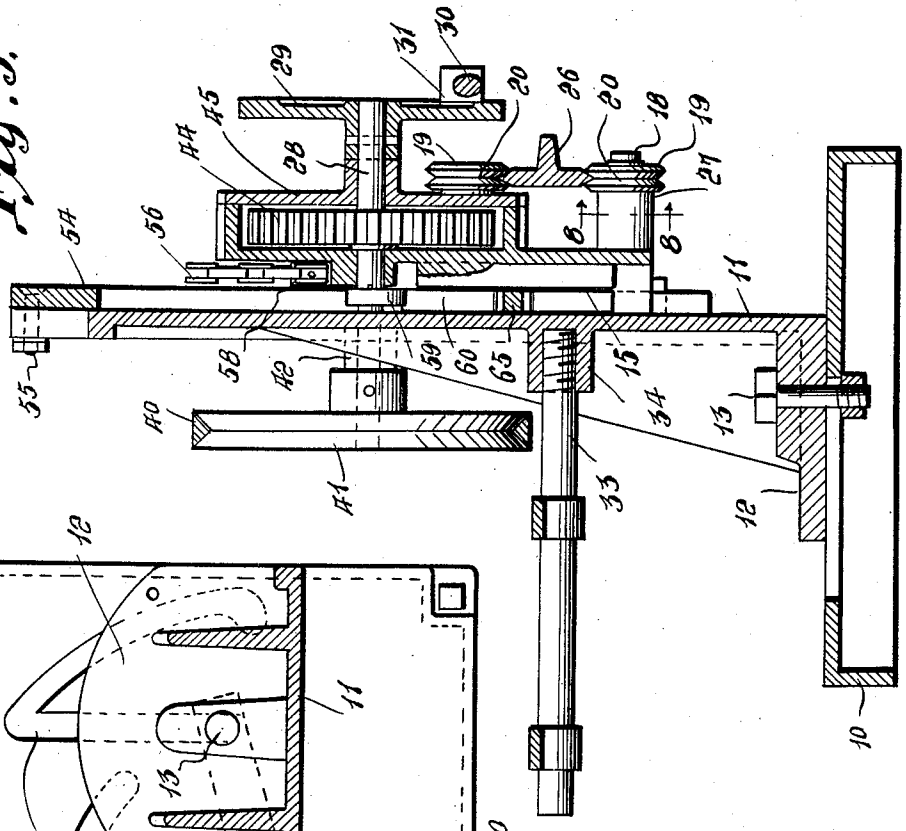


Fig. 4.

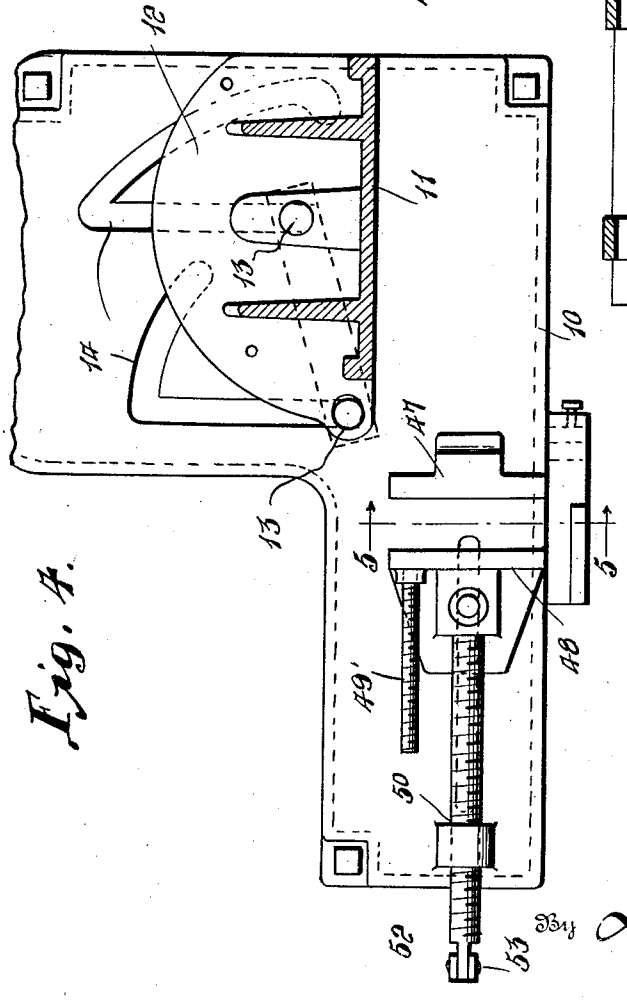
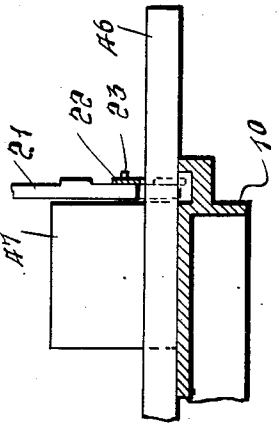


Fig. 5.



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Fig. 6.

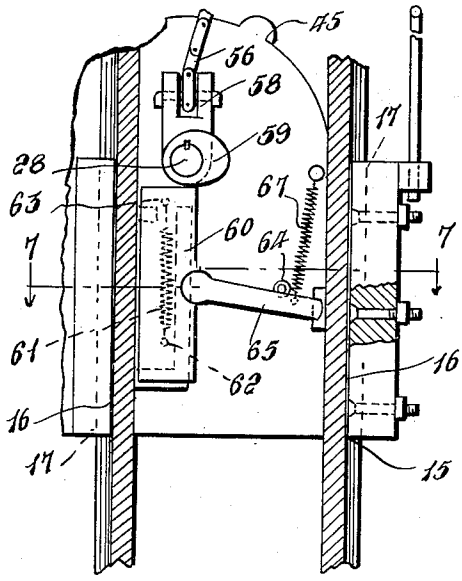


Fig. 7.

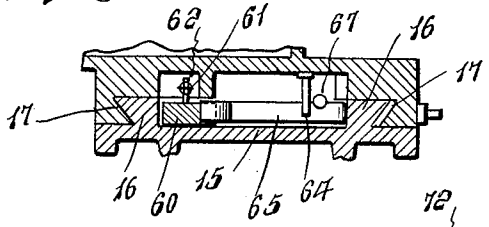
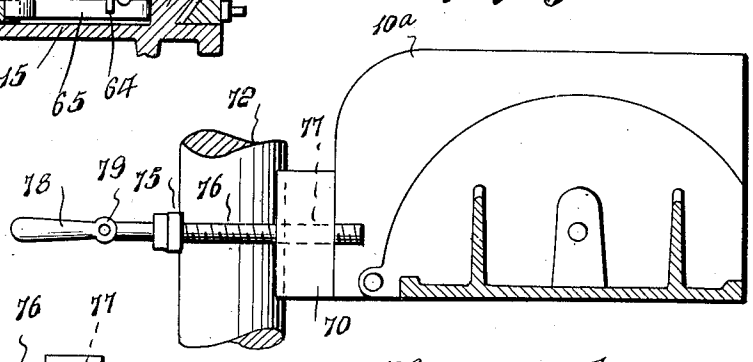


Fig. 9.



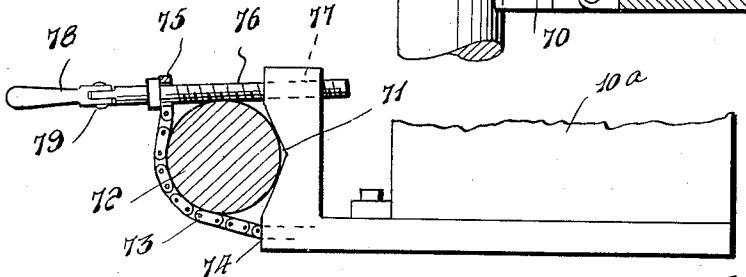


Fig. 10.

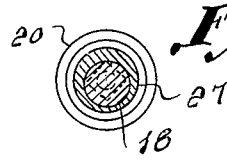


Fig. 8.

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POWER HACKSAW

Chester Irvin Duvall, Huntington Park, Calif.

Application May 12, 1938, Serial No. 207,614

3 Claims. (Cl. 29—73)

This invention relates to a power hacksaw or the like designed especially but not necessarily for cutting metals.

It is aimed to provide a structure having a minimum of castings for the mounting and support of the operating parts; a construction wherein the saw will be automatically lifted incidental to return to initial position; a structure wherein the saw frame freely slides on roller means; a construction wherein the column which mounts the saw, may be adjusted relatively to the work, and a construction facilitating attachment of the work rigidly with respect to the saw.

The more specific objects and advantages will become apparent from a consideration of the description following taken in connection with accompanying drawings illustrating an operative embodiment.

In said drawings:

Figure 1 is a plan view of the improved hacksaw apparatus;

Figure 2 is a side elevation of said apparatus;

Figure 3 is a vertical sectional view taken substantially on the plane of line 3—3 of Figure 2;

Figure 4 is a horizontal sectional view taken substantially on the plane of line 4—4 of Figure 2;

Figure 5 is a section taken substantially on the plane of line 5—5 of Figure 4;

Figure 6 is a vertical section particularly showing parts between the column and gear casing;

Figure 7 is a horizontal section taken on the plane of line 7—7 of Figure 6;

Figure 8 is a detail section taken on the line 8—8 of Figure 3;

Figure 9 is a horizontal section through a modified form, particularly showing a second form of base, and

Figure 10 is a fragmentary elevation of the parts of Figure 9.

Referring specifically to the drawings wherein like reference characters designate like or similar parts, a base is provided at 10, of any desired configuration, preferably being a metallic casting. Rising from said base 10 is another casting in the form of a column 11, which is adjustably mounted on the base, so that the saw or operating parts may be disposed at different angles and positions relatively to the work. To this end, the column 11 has a plate 12 through which bolts 13 pass and which also are disposed in irregular slots 14 so that they may be moved, to vary the angularity of the column 11 and fasten the column 11 rigidity in the different positions.

Vertically slidable along the column 11 is a slide 15, preferably a casting. Said slide 15 has a dovetailed projection 16, interfitted in a dovetailed groove or slot 17 of the column. Said slide 15 has four studs 18 extending therefrom on which rollers 19 are journaled and which rollers have their peripheries grooved of V-form as shown at 20.

A generally inverted U-shaped frame 21 is adapted to carry a hacksaw blade 22 removably, in any desired manner, such blade being secured at one end to a projection 23 on said frame and at the other end to a projection 24 on adjustable securing means 25 of any desired type. Said frame 21 is preferably a casting and integral therewith is a mounting rail 26 whose longitudinal edges are beveled from opposite sides so as to fit the grooves 20. In order to provide for the take up of wear from time to time, the stub shafts or studs 18 may have bushings 27 adjustably mounted thereon, and on which bushings the rollers 19 are directly mounted.

Journaled on the plate 15 is a shaft 28, at the forward end of which, a disk 29 is keyed. A pitman 30 is pivoted by a wrist pin 31 to said disk 29 and by a wrist pin 32, to the hacksaw frame 21 so that rotation of the disk 29 will through the medium of the pitman 30, reciprocate the hacksaw frame 21 and accordingly the hacksaw blade 22.

Extending rearwardly from the column is a rod 33 which is screwed to a boss 34 on said column, as shown. A platform 35 by means of straps 36 is pivoted on said rod 33. On the platform 35, a prime mover, usually an electric motor 37 is fastened, and the power from which is used to rotate shaft 28 and accordingly reciprocate the saw blade 22. On the shaft 38 of said motor, a pulley 39 is keyed, over which a belt 40 passes and which also passes over a pulley 41 keyed on a shaft 42. Shaft 42 is journaled in the slide 15. Intermeshing gearing 44 drives the shaft 28 from the shaft 42 and the slide 15 is supplemented or formed so as to provide a gear casing 45 around said gearing 44. Since the motor 37 is pivoted at 36 on rod 33, it tends to swing downwardly and thus by gravity tension the belt 40, at all times.

The work adapted to be sawn is suggested at 46, located between a fixed jaw 47 on the base 10 and a movable jaw 48 slidable on said base and controlled through the actuation of a screw 49, threaded at 50 in a portion of the base 10. Such screw is swivelled as at 51 in the jaw 48 and it is adapted to be operated for instance by a lever 52 pivoted at 53 to said screw 49. Adjacent screw 49 is a screw 49' which is adjustable

to keep the jaws parallel in holding work which is shorter than the jaws.

It will be realized that the member 15 together with the frame 21 and saw are freely slidable and that the blade 22, by gravity rests on the work 46 and lowers automatically through gravity, as cutting progresses.

The said slide 15 and all parts carried thereby may be lifted, when desired as a unit, through operation of a lever 54 pivoted at 55 on the column 11. Fastened to said lever is a chain or flexible element 56, as at 57 and which chain is also fastened as at 58 to the slide 15.

Means are provided whereby the saw frame 21 and accordingly the blade 22 will be lifted and held lifted during return to normal position, after a sawing stroke, to prevent the rapid dulling of the saw teeth as would be the case if the saw were pulled back with the full weight thereon. To this end a cam 59 is keyed on the end of shaft 28 adjacent the column 11. Cam 59 engages the upper end of a slidable block 60, normally disengaged from the column 11 and urged upwardly into contact with the periphery of cam 59 by a contractile coil spring 61, fastened at 62 to the block and at 63 to the slide. Pivoted on the slide 15 as at 64 is a dog 65, one end of which has bearing contact against the block 60, and the other end of which is normally disengaged with the column 11, a contractile coil spring 67, normally urging the free end of the dog 65 upwardly. The surfaces engaged by block 60 and dog 65 operate against smooth edges rather than against small notches, which soon wear away and are unreliable. As a result of the construction described, the block 60 and dog 65 will not interfere with lowering of the slide 15 and connected parts nor will it interfere with the lifting of such parts through the lifting of the lever 54. However, when the shaft 28 is rotating, at the end of a sawing or work stroke of the blade 22, the lobe of cam 59 will depress the block 60, swinging the lever 65 on the pivot 64, and thus wedging the block 60 and free end of the lever into contact with adjacent parts of the column 11. When thus wedged, block 60 being stationary, the cam 59 turning on the upper end thereof will cause the slide 15 and all parts connected therewith including the saw frame 21 and blade 22 to lift and while lifted reciprocate back to initial position and then lower for the succeeding work stroke of the saw, such movement being controlled through the contour of said cam 59 and of course when the saw is in position to start a sawing operation, springs 61 and 67 will have restored the block 60 and dog 65 to normal or released positions.

A modified form of base 10 may be resorted to when desired and for instance as shown at 10a in Figures 9 and 10. Such base has a vertical portion 70 notched as at 71 to receive the work 72, which is held therein through the medium of a chain 73 anchored to the base 10a as at 74, and the upper end of which has a ring 75 co-acting with a clamping screw 76 screw threaded at 77 in the member 70. An operating handle 78 may be pivoted at 79 to said screw 76. This construction, it will be realized, will enable the saw to be taken to the work that may be too heavy or awkward to be brought to the saw.

Various additional changes may be resorted to provided they fall within the spirit and scope of the invention.

I claim as my invention:

1. Sawing apparatus of the class described having a column, a slide movable on said column, a saw frame slidably mounted by the slide, means operable to reciprocate the saw frame comprising a motor, means pivotally mounting the motor on the column, and an endless driving member extending from the motor as part of said means whereby gravity will cause the tensioning of the endless driving member.

2. Sawing apparatus of the class described having a column, a slide vertically movable on the column, a saw frame movably mounted on the slide means operable to reciprocate the saw frame, a cam operated by said means, means on the slide adapted to bind against the column through operation of the cam to thereupon form a fixed abutment for the cam to cause lifting of the frame incidental to its return to starting position, said second mentioned means comprising a block normally disengaged with the column, spring means urging the bock into engagement with the cam, and a wedging member on the slide operated by the block under action of said cam to cause the block to bind against the column.

3. Sawing apparatus of the class described having a column, a slide vertically movable on the column, a saw frame movably mounted on the slide, means operable to reciprocate the saw frame, a cam operated by said means, means on the slide adapted to bind against the column through operation of the cam to thereupon form a fixed abutment for the cam to cause lifting of the frame incidental to its return to starting position, said second mentioned means comprising a block normally disengaged with the column, spring means urging the block into engagement with the cam, a wedging member on the slide operated by the block under action of said cam to cause the block to bind against the column, said wedging means comprising a lever pivoted to the slide, said lever being engaged with the block, and a contractile coil spring connected to the lever and to the slide.

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